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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/568,007

**Applicant(s)**

JEONG ET AL.

**Examiner**

SUNG AHN

**Art Unit**

2611

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01 June 2011 has been entered.

### ***Response to Amendment***

2. This action is in reply to the Applicant's amendments filed on 01 June 2011.
3. Claims 22, 26, 33, 37, and 48 have been amended.
4. Claims 1-21 have been canceled.
5. Claims 22-51 are currently pending and have been examined.

### ***Response to Arguments***

6. Claims 22, 26, and 33 have been amended to overcome the claim objection. The objections to claims 22, 26, and 33 are hereby withdrawn.
7. Drawing objection for not showing details of system decoding means for decoding the demultiplexed digital multimedia stream to produce media stream, additional data, and data objectified for an interactive service similar to one shown for

system encoder in Fig. 4 is **withdrawn** as the applicant explains the Fig. 3A shows MPEG-4 system decoder block (325) corresponding to system encoder block (313) and claimed invention does not have any claims regarding the details of systems decoding means of the receiver.

8. Applicant's arguments filed on 16 September 2010 have been fully considered but they are not persuasive.

On pages 14-16 of the Applicant's Response, applicant argues nowhere do any of the cited references disclose, suggests, or mentioned features of claims 22 (similarly claims 33, 37, and 48) "a **first** transmitting means for transmitting a digital media broadcasting media stream outputted from the interleaving means, where the first transmitting means is **any** one of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, **or** a digital cable broadcasting system". The presently claimed invention transmits and receives multimedia data efficiently from a same device and stably based on the DAB system and any one of the other diverse digital broadcasting systems in order to provide diverse interactive broadcasting service having an excellent reception performance with out breaks by compressing video and multimedia data efficiently (supporting interactive service). Therefore, the applicants respectfully submit that the cited prior art references fails to disclose or suggest each and every one of the limitation recited in claims 22.

The Examiner respectfully disagrees with Applicant's arguments because Jeong disclose the digital audio broadcasting system (Fig. 1, paragraph [0016]) for transmitting

digital audio signal along with encoded data over RF signal (Fig. 1, paragraph [0016, 0019, 0048]) thus Jeong described the first transmitting means (digital audio broadcasting system) that is any one of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, or a digital cable broadcasting system cited in claims 22 and similarly to claims 33, 37, and 48. Jeong further disclose similar system of Digital Video Broadcasting-Terrestrial (DVB-T) system developed in Europe similar to Digital Audio Broadcasting (DAB) or current invention and the cited reference Ahn further disclose the digital broadcasting of the audio and video data in packetized data stream (abstract, Page 1 lines 26-31). Therefore, both Jeong and Ahn teach the limitation of first transmitting means that is one of digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system as recited in claims 22, 33, 37, and 48.

### ***Claim Objections***

9. Claim 22 is objected to because the word "from the encoding means" need to change to "from the audio/video encoding means" in line 4. Appropriate correction is required.
10. Claim 22 is objected to because the word "the system encoding means" need to change to "the systems encoding means" in line 4. Appropriate correction is required.

11. Claim 24 is objected to because the word "the encoding means" need to change to "the audio/video encoding means" in line 1. Appropriate correction is required.
12. Claim 25 is objected to because the word "the encoding means" need to change to "the audio/video encoding means" in line 1. Appropriate correction is required.
13. Claim 34 is objected to because the word "the decoding means" need to change to "the audio/video decoding means" in line 1. Appropriate correction is required.
14. Claim 35 is objected to because the word "the decoding means" need to change to "the audio/video decoding means" in line 1. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 22, 23, 26-30, 33, 37, 38, 41-45, 48, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. in further view of WIPO Pub. No. WO 02/058388 to Ahn et al.

As to **Claims 22 and 37**, Jeong disclose a digital multimedia broadcasting (DMB) system and method, comprising:

an audio/video encoding means for encoding inputted audio/video signals (Fig. 1 (11-14));

a multiplexing means for multiplexing the media stream (Fig. 1 (15), Fig. 6, paragraph [0051], where the encoded audio and data is multiplexed to MPEG-2 transport stream to be transmitted through modulation part);

an error correction encoding means for performing additional error correction encoding onto a media stream outputted from the multiplexing means (Fig. 1 (30), paragraph [0053, 0056], where the Reed-Solomon (RS) encoder for error correction);

an interleaving means for removing temporal correlation between adjacent byte units within a media stream outputted from the error correction encoding means (Fig. 1 (40), Fig. 7, paragraph [0053, 0061], where the outer interleaver performing byte-wise interleaving);

and a first transmitting means for transmitting a DMB media stream outputted from the interleaving means (Fig. 1 (120, 130, 140), paragraph [0051], where the MPEG-2 transport stream is modulated and transmitted),

wherein the first transmitting means is one of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system (Fig. 1, paragraph [0016, 0019], where the present invention is directed to the digital audio broadcasting system).

Jeong disclose the transmission of encoded audio and data in MPEG-2 transport stream with added error correcting coding and interleaving (Fig. 1, paragraph [0051, 0053, 0061]) but does not explicitly disclose of the digital media broadcasting of synchronized video and the interactive service objectifying data through system encoding means.

Meanwhile Ahn disclose the transmission of MPEG-4 synchronized with MPEG-2 data by synchronizing (packetizing) the audio and video data along with object information such as object descriptor (OD) and binary format for scene (BIFS) through sync layer (SL) packetizer (Fig. 1 (131)) (Fig. 1, Page 1 line 25—Page 2 line 14, Page 7 line 31 – Page 8 line 3). Also the communication of interactive audio-visual scenes (data object for interactive service) is one of standard service supported along with video/audio for MPEG-4 format as described in ISO/IEC 14496-1 International Standard (Fig. 1, Section 0.6.2 on pages 10-11) and IEEE Journal "Virtual Shop and Virtual Meeting Point - Two Prototype Application of Interactive Services Using the New Multimedia Coding Standard MPEG-4" (abstract) presented here as evidential reference.

Therefore, one of ordinary skilled in the art would have found obvious from the combined teachings of Jeong and Ahn as a whole to produce the invention as claimed on expectation providing both MPEG-2 and MPEG-4 data for broadcasting and communication seamlessly by synchronizing newly proposed MPEG-4 format to existing MPEG-2 communication scheme (Ahn – Page 1 lines 13-23).

As to **Claims 33 and 48**, Jeong disclose a digital multimedia broadcasting (DMB) system and method, comprising:

a first receiving means for receiving digital multimedia broadcasting media stream (Fig. 1, paragraph [0016, 0019, 0100], where the receiver of the digital audio broadcasting system include the corresponding deinterleaver and RS decoder (paragraph [0100]) to match the transmitter side and it will implicitly requires same RF receiving means to receive the broadcasted audio signal for deinterleaving and decoding);

a deinterleaving means for deinterleaving the received digital multimedia broadcasting media stream which is interleaved to remove temporal correlation in adjacent byte units (Fig. 1 (40), Fig. 7, paragraph [0053, 0061, 0100], where the receiver of the digital audio broadcasting system include the corresponding deinterleaver for deinterleaving the byte-wise interleaved data stream);

an error correction decoding means for performing additional error correction decoding onto deinterleaved digital multimedia broadcasting media stream which is generated from additional error correction encoding (Fig. 1 (30), paragraph [0053, 0056, 0100], where the receiver of the digital audio broadcasting system include the corresponding Reed-Solomon (RS) decoder for decoding encoded data stream by the Reed-Solomon (RS) encoder for error correction in transmitter side);

a demultiplexing means for demultiplexing the additional error correction decoded digital multimedia broadcasting media stream which is multiplexed (Fig. 1 (15), paragraph [0051, 0100], where the receiver of the digital audio broadcasting system will implicitly requires the corresponding demultiplexing means for demultiplexing RS decoded data stream for audio and data decoding. Also the conventional demultiplexer (Fig. 1 (170)) after RS decoder (140) is shown in paragraph [0015] and Fig. 1 of U.S. PGPub. No. 20060150066 presented here as evidential reference);

a audio/video decoding means for decoding the media stream into audio/video signals (Fig. 1 (11, 12, 13, 14), paragraph [0051, 0100], where the receiver of the digital audio broadcasting system will implicitly requires the corresponding decoding means for decoding the data stream into appropriate audio and data signals. Also the conventional audio and video decoder after demultiplexer (Fig. 1 (170)) is disclosed in paragraph [0015] of U.S. PGPub. No. 20060150066 presented here as evidential reference);

wherein the first receiving means is one of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system (Fig. 1, paragraph [0016, 0019], where the present invention is directed to the digital audio broadcasting system).

Jeong disclose the receiving of encoded audio (media stream) and data in MPEG-2 transport stream with added error correcting coding and interleaving for

corresponding deinterleaving and RS decoding (Fig. 1, paragraph [0051, 0053, 0061, 0100]) but does not explicitly disclose of generating the interactive service objectifying data through system decoding means.

Meanwhile Ahn disclose the transmission of MPEG-4 synchronized with MPEG-2 data by synchronizing (packetizing) the audio and video data along with object information such as object descriptor (OD) and binary format for scene (BIFS) through sync layer (SL) packetizer (Fig. 1 (131)) (Fig. 1, Page 1 line 25—Page 2 line 14, Page 7 line 31 – Page 8 line 3). Also the communication of interactive audio-visual scenes (data object for interactive service) is one of standard service supported along with video/audio for MPEG-4 format as described in ISO/IEC 14496-1 International Standard (Fig. 1, Section 0.6.2 on pages 10-11) and IEEE Journal "Virtual Shop and Virtual Meeting Point - Two Prototype Application of Interactive Services Using the New Multimedia Coding Standard MPEG-4" (abstract) presented here as evidential reference. Further, the receiver side implicitly extracts the interactive service objectifying data through the extracting/decoding means corresponding to the synchronizing through packetizing of MPEG-4 with MPEG-2 data in transmitter of the digital broadcasting system (Page 1 line 26 – Page 2 line 14, Page 14 lines 22-29).

Therefore, one of ordinary skilled in the art would have found obvious from the combined teachings of Jeong and Ahn as a whole to produce the invention as claimed on expectation providing both MPEG-2 and MPEG-4 data for broadcasting and communication seamlessly by synchronizing newly proposed

MPEG-4 format to existing MPEG-2 communication scheme (Ahn – Page 1 lines 13-23).

As to **Claims 23 and 38**, Jeong in view of Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the audio/video signal is encoded and transmitted in predetermined format (MPEG-2, MPEG-4, etc) but does not explicitly disclose converting audio/video signal to predetermined format by preprocessing before encoding. Meanwhile it is well known in art that raw video/audio source (analog) is converted to frame of data of certain format (digital) before encoded through use of digital camcorders, digital cameras, etc. The generation of video frame from standard source before encoding is shown in Fig. 1 and Col. 1 lines 28-37 of U.S. Pat. No. 6570926 presented here as evidential reference.

As to **Claims 26 and 41**, Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the synchronizing means include:

an Object Descriptor (OD)/Binary Format for Scene (BIFS) generating means for generating OD/BIFS for interactive service (Fig. 1 (121), Page 7 line 31 – Page 8 line 3, where the object separator extract the object descriptor (OD) and binary format for scene (BIFS) and send to sync layer packetizer along with audio and video for generating synchronized packet stream);

an Initial Object Descriptor (IOD) generating means for generating an IOD (Fig. 1 (121), Page 7 line 31 – Page 8 line 3, where the object separator extract the initial object descriptor (IOD) to be used in PSI);

a sync layer packetizing means for synchronizing media streams outputted from the encoding means and the OD/BIFS generating means (Fig. 1 (131), Page 7 line 31 – Page 8 line 3, where the sync layer packetizer packetizes the audio and video along with OD and BIFS for generating synchronized packet stream);

The suggestion/motivation is the same as that used in the rejection for claims 22 and 37.

As to **Claims 27 and 42**, Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the multiplexing means includes:

a PES packetizing means for generating a Program Elementary Stream (PES) based on a packet outputted from the sync layer packetizing means (Fig. 1 (136));

a section packetizing means for generating section based on data which is outputted from the IOD generating means and a packet which is generated in the sync layer packetizing means based on a OD/BIF stream, wherein the OD/BIFS stream is outputted from the OD/BIFS generating means (Fig. 1 (134, 135), Page 7 line 31 – Page 8 line 3, where the PSI generator generating PSI using IOD from object separator);

a transport stream (TS) packetizing means for packetizing data outputted from the PES packetizing means, the section packetizing means and the PSI generating means into transport stream (Fig. 1 (137))

The suggestion/motivation is the same as that used in the rejection for claims 22 and 37.

As to **Claims 28 and 43**, Ahn further disclose the digital multimedia broadcasting (DMB) system wherein the section packetizing means includes:

a 14496 section packetizing means for generating 14496 section based on the packet which is generated in the sync layer packetizing means based on the OD/BIFFS streams (Fig. 1 (135));

a Program Service Information (PSI) generating means for generating PSI based on the data outputted from the IOD generating means (Fig. 1 (134), Page 7 line 31 – Page 8 line 3, where the PSI generator generating PSI using IOD from object separator);

The suggestion/motivation is the same as that used in the rejection for claims 22 and 37.

As to **Claims 29, 36, 44, and 51**, Jeong further disclose the digital multimedia broadcasting (DMB) system wherein the error correction encoding means is a RS encoder/decoder (Fig. 1 (30), Fig. 6, paragraph [0056, 0100],

where the shortened RS code (204, 188,  $t=8$ ) is used for correcting errors to enhanced the bit error rate (inherent function of RS encoder/decoder)).

As to **Claims 30 and 45**, Jeong further disclose the digital multimedia broadcasting (DMB) system wherein the interleaving means is formed of 12 branches, and each branch, where is formed of memories based on a 17-byte x N unit ( $N=0,1,2, \dots, 11$ ), has input and output switches synchronized with each other, and a synchronizing word for synchronization is transmitted always through a '0' branch and the synchronization of a deinterleaver is obtained by allocating the first recognized synchronization word to the '0' branch (Fig. 7, paragraph [0061], where the interleaver composed of 12 branches with 17-byte x N shift registers (memory) and sync byte always be routed through branch '0').

17. Claims 24, 25, 34, 35, 39, 40, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. and WIPO Pub. No. WO 02/058388 to Ahn et al. in further view of White Paper "AVC + AAC The Next Generation of Compression" by Harmonic.

As to **Claims 24, 25, 34, 35, 39, 40, 49, and 50**, Jeong in further Ahn disclose the digital multimedia broadcasting (DMB) system with MPEG-4 audio/video data (Ahn – Page 1 lines 26-33) and MPEG-2 audio coding/encoding and decoding (codec) using Advanced Audio Coding (AAC) but does not

explicitly disclose of the using other coding/encoding and decoding (codec) format of "MPEG-4 Part 2" or "MPEG4-Part 10 Advanced Video Coding (AVC)" as video encoder and "Advanced Audio Coding (AAC)", "AAC+", or "Bit Sliced Arithmetic" Coding (BSAC)" as audio encoder.

Meanwhile it is well know in art that MPEG-4 supports additional coding/encoding and decoding (codec) format to take full advantage of new standard. Also Harmonic white paper disclose the new standard codec format of MPEG-4 Part 10 or MPEG-4 Advanced Video Coding along with high efficiency Advanced Audio Coding (AAC) proposed by ITU and ISO to achieve 40-50% gain over MPEG-2 system (Page 2 - 2<sup>nd</sup> paragraph, Page 3 – 5<sup>th</sup> and 6<sup>th</sup> paragraph).

Therefore, one of ordinary skilled in the art would have found obvious from the combined teachings of Jeong, Ahn, and Harmonic white paper as a whole to produce the invention as claimed with on expectation of improving digital broadcasting system using improved compression of audio/video signal (more data in transmitted signal) using newly proposed standard of coding/encoding and decoding (codec) format of "MPEG-4 Part 10 Advanced Video Coding" along with high efficiency Advanced Audio Coding (AAC).

18. Claim 31 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. and WIPO Pub. No. WO 02/058388 to

Ahn et al. in further view of European Telecommunication Standard Institution Draft for Digital Audio Broadcasting (DAB) Ensemble Transport Interface to ETSI.

As to **Claims 31 and 46**, Jeong in further Ahn disclose the digital audio broadcasting (DAB) system for providing services through the interleaved digital multimedia broadcasting media stream (Jeong – Fig. 1, paragraph [0003, 0015]) but does not explicitly disclose the an Ensemble Transport Interface (ETI) converting means for converting the digital multimedia broadcasting media stream into an ETI frame and delivering the ETI frame to the first transmitting means.

Meanwhile ETSI disclose the proposed the Ensemble Transport Interface (ETI) for Digital Audio Broadcasting system to be transmitted over the transport network using ETI frame format (Page 8 - Introduction, Page 55 - Fig. 12, Page 11 - Scope).

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong, White, and ETSI as a whole to produce the invention as claimed with on expectation expanding the number of different physical media including the transport network for the broadcasting of digital multimedia stream (ETSI – Page 11 (Scope)).

19. Claim 32 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PGPub. No. 20020080887 to Jeong et al. and WIPO Pub. No. WO 02/058388 to Ahn et al. in further view of U.S. Pat. No. 7492786 to Ferris.

As to **Claims 32 and 47**, Jeong in further Ahn disclose the digital multimedia broadcasting (DMB) system transmitting the interleaved digital multimedia broadcasting media stream (Jeong – Fig. 1 (120, 130, 140), paragraph [0051]) (Ahn – abstract) but does not explicitly disclose the an Internet Protocol (IP) datagram converting means for converting the digital multimedia broadcasting media stream into an IP datagram and delivering the IP datagram to the first transmitting means.

Meanwhile Ferris disclose the encoding the digital streaming media and sending to the central multiplexer using IP based protocol to reduce the cost over sending the digital streaming data using service transport interface (STI) (abstract, Col. 2 line 67 – Col. 3 line 23).

Therefore, one of ordinarily skilled in the art would have found obvious from the combined teachings of Jeong, White, and Ferris as a whole to produce the invention as claimed with on expectation of reducing the cost of transmitting the digital multimedia stream using IP based protocol.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUNG AHN whose telephone number is (571)270-3706. The examiner can normally be reached on Monday-Friday, 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571)272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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